Are GAN Generated Images Easy to Detect? A Critical Analysis of the State-Of-The-Art

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Abstract

The advent of deep learning has brought a significant improvement in the quality of generated media. However, with the increased level of photorealism, synthetic media are becoming hardly distinguishable from real ones, raising serious concerns about the spread of fake or manipulated information over the Internet. In this context, it is important to develop automated tools to reliably and timely detect synthetic media. In this work, we analyze the state-of-the-art methods for the detection of synthetic images, highlighting the key ingredients of the most successful approaches, and comparing their performance over existing generative architectures. We will devote special attention to realistic and challenging scenarios, like media uploaded on social networks or generated by new and unseen architectures, analyzing the impact of suitable augmentation and training strategies on the detectors' generalization ability.